NOTES.

Moderate illumination of the peripheral parts of the retina by light concentrated with a lens on the sclerotic increases the acuteness of vision in most normal eyes. Letters are made to appear blacker, and some not before legible become so. Only when the illumination is considerable does it interfere with vision. In a number of eye-diseases, however, the least side illumination produces disturbance at once.—(SCHMIDT-RIMPLER, *Ber. d. XIX Vers. d. ophth. Gesellsch. zu Hamburg.*)

Charpentier gives, in the *C. r. Soc. de Biologie*, Mai 19, 1888, the results of experiments showing that the difference in brightness of two neighboring illuminated surfaces can best be seen with the central parts of the retina, except a less sensitive central spot. The discriminative sensibility falls off rapidly toward the periphery. It is better, however, on the outside than on the inside of the field of view, and above than below.

The same experimenter (*ibid.* Mai 16, 1888), taking neighboring surfaces, one illuminated continuously, the other instantaneously, adjusted the sources of light so that the surfaces appeared equally bright, and then weakened both illuminations equally. The continuously illuminated surface appeared the brightest, and indeed when the illumination was very much reduced was the only one seen. When both surfaces were illuminated for different lengths of time and yet made to appear equally bright, and the size of their images was then reduced by a concave lens or by withdrawing from them, the one most briefly illuminated appeared the clearer and brighter.

The number of the visual units in parts of the retina has been redetermined by Wertheim after the method of C. du Bois-Reymond (*v. Graefe's Arch. f. Ophth.* XXXIII, 2). He made use of a plate of tinfoil pierced with 460 holes of 0.24 mm. in diameter. The distances were found at which the holes seemed to form lines and the lines a surface. Calculations from the first give 74, from the second 147 visual units in the centre of the fovea, to a square 0.01 mm. on the side. Going out from the middle of the fovea toward the temple, the following results were found for the same area:

Distances in mm.	0.	0.15	0.3	0.45	0.6	0.7	1.0	1.55	2.4
From first measurement, .	74	37	27	28	24	18	15	13	10
" second " .	147	77	53	53	50	40	33	27	20

The sudden fall in the number between 0.6 and 1.0 mm. is probably due to passing into the region of more numerous rods outside the yellow spot.

The time required to perceive the form of images that do not extend beyond the yellow spot has been found by Nordmann (abstract in *Jahresb. der Anat. u. Physiol.* Bd. XVI, Abth. 2, p. 176) to be for the adapted eye inversely proportional to the illumination. With constant illumination the time increases inversely as the size of the image. This seems true also of the unadapted eye, but the absolute time is longer. The illumination used in the experiments was furnished by a candle behind ground glass, the time was regulated by a pendulum, the objects were Snellen figures (*Haken*).

It is familiar that faded after-images may be recalled by rubbing the eyes. Dr. Ch. Féré finds (*C. r. de la Soc. de Biol.* July 30, 1887) that the same can be done in other ways, as for example by applying a tuning-fork to the skull. He finds also this somewhat similar phenomenon (*ibid.* Dec. 10, 1887). A sensation too weak to reach consciousness alone may succeed in doing so with the help of a strong one in some other sense. An hysteric looks at letters that are too far away to be read. They are then covered, a strong sensory stimulus administered, and the letters are read from their previous impression. It would be extremely interesting to know whether such experiments are possible with normal persons.

In the opinion of Bjelow (*Westnik. Opht.* IV, 3 and 4; Abstract in *Jahresb. Anat. u. Physiol.* Bd. XVI, Abth. 2), the rest position of the eyes is divergent. The eye, however, does not necessarily return to it when simply covered. Even the introduction of prisms cannot cause the eye to diverge beyond its rest position.

A. Chauveau, after a study of the mechanism of iris movements (*C. r. Soc. Biologie*, April 14, 1888), pronounces for the non-existence of a dilator muscle of the iris, that office being performed by simple elastic fibres. He bases his statement chiefly on the fact that the latency period for both contraction and dilation is the same, about half a second, which could hardly be the case if a *dilator iridis* were really present and innervated through the roundabout way of the cervical cord and cervical sympathetic. In this view he has the support of Rouget, Grühagen, Retterer, and others. The latency period was determined by observation of the diffraction circles of a set of needle-pricks in a card held before one eye while the other was darkened and lighted.

Eye-strain is a recognized factor in the production of many nervous troubles. Dr. Geo. M. Gould points out (*Med. and Surg. Reporter*, Sept. 29, 1888), in addition, an obvious mental and educational effect. The child for whom the process of learning is made laborious or painful by imperfect vision, is so far handicapped, and as a result may appear stupid and actually be disinclined to study. In one of three cases given in illustration, correction of the optical defects seems to have been followed by most happy intellectual results.

A convenient chart for rapidly testing the vision of school children and others is that devised after the principle of Snellen by Prof. Hermann Cohn. The essential part of the chart is a set of thirty-six capital letter E's, arranged in a square, six on a side. Each

letter is itself about a third of an inch square. They face up, down, right and left. Any one that can tell their facing at the rate of 1 per second with proper illumination, at a distance of six metres, has the acuteness of vision assumed by Snellen as unity, $\frac{6}{6}$. If one has to come a metre nearer to do so his vision is $\frac{5}{6}$, and so with the rest. The chart is provided with four brass eyes, one at the middle of each side, so that it can be given four positions, and the possibilities of learning the positions by heart made less. A set of lenses in wooden frames for ready handling would also allow the fixing of the degree of short or over-sightedness. When the sight of one pupil has been established as normal, the chart may be used to find whether or not the illumination of the school-room is sufficient, by finding whether he can tell the facings at the normal distance.

In *du Bois-Reymond's Archiv*, No. 3–4, 1888, L. Jakobson proposes the use of the receiving telephone thrown into motion by changes in intensity of a varying current, for the numerical determination of the acuteness of hearing. It may be assumed on physical principles that the variation in the intensity of the sound is proportional to the square of the variations in the current. Gradations of the current are to be introduced by the insertion of shunts of different resistance. While these resistances remain smaller than the rest of the circuit, the variation of the current in the telephone will be, with an error of not more than 2.5 per cent, directly proportional to the resistances used. It is thus easy to so adjust the sound as to find the auditory threshold. The author suggests an apparatus in which a tuning-fork vibrating before the poles of an electro-magnet is used to produce with regularity the original current.

Hernicke (*Untersuchungen über den Temperatursinn*, Inaug. Diss. Bonn, 1887) finds that in tabes dorsalis the discrimination for differences of temperature is much below the normal.

In a case reported by Dr. J. H. Lloyd of Philadelphia, to the last meeting of the Am. Neurol. Assoc. (*Boston Med. and Surg. Jour.* October 11, 1888), it was found, after the arm area of the cortex had been removed for Jacksonian convulsions, that though the perception of form and motion was abolished, the pure sensation of touch was not in the least disturbed.

The self-adjustments of plants with reference to light and gravity have already been the subject of careful study. In the *Sitzungsbr. der Phys.-Medic. Gesellsch. zu Würzburg*, Jahrg. 1888, No. 1, J. Loeb makes a preliminary communication of experiments of his that go toward demonstrating the same in animals. Bilateral animals tend to place themselves so that the rays of light fall parallel to the median plane of their bodies. There is, however, this difference of habit: some turn their oral pole and ventral surface to the light, others their aboral pole and dorsal surface, and in exceptional cases the aboral pole and ventral surface. With equal intensities of illumination, animals seem far more affected by the strongly refracted rays, but the influence of the less refracted rays increases with increased differentiation of organs; so that, for example, flies of

musca vomitoria were clearly affected by red light, while the eyeless grubs, though under other circumstances heliotropic, were not. The animals seem to adjust themselves rather to the direction in which the rays pierce their tissues, than to light and shade. The intensity of the light also is important, for only within certain limits of intensity are the phenomena to be observed, and the quickness and precision of the adjustments are different for different intensities. That the reaction is really to light and not to heat, is proved by the fact that diffused daylight, light passed through concentrated alum solution, and the more refracted rays of the spectrum, all produce the turning, the last in a greater degree than the hotter rays. In the author's opinion these phenomena are related to "seeing," and indicate that what we are wont to call a psychic function is in some sense a property of all living matter.

In response to gravity, flies with clipped wings set themselves, other things being equal, so that their median plane is vertical and their head is up. In other experiments, roaches very strongly objected to having gravity act perpendicularly upon their ventral surface.

In somewhat the same direction, but upon lower organisms, were the experiments of R. Aderhold (*Jena'sche Zeitschr. f. Naturwissenschaft*, XXII, 1–2, 1888). He found that Euglena and others are not influenced in their direction of movement by water currents, *i. e.* are not rheotropic; they are, however, aërotropic and geotaxic. The last two characteristics would be of use to Euglena in coming to the surface when accidentally covered up in any way. Other organisms, including diatomes and oscillaria, seem to regard none of these things and respond to light alone. Desmids are positively phototaxic with weak light and negatively with strong light. Algae set themselves with a definite position of their axis toward the light because they tend to move toward it. The angle at which they place themselves with reference to the surface below them in moving forward seems always to be that at which friction is least.

Two peculiar cases of aphasia have been observed by Dor (*Rev. générale d'Opht.* 1887, p. 155) in which, while color perception remained, the color names were lost.

In a study of the mental state of the hereditarily degenerate who do not reach full insanity (*Arch. génér. de méd.* March–April, 1888), Ballet relates, with other cases, one of a bookbinder, of convergent bad heredity, 37 years old, and a polymath in a small way. After a long period of daily attacks of palpitation, shortness of breath, aura-sensations, etc., he experienced while reading an attack of a severer sort, with loss of consciousness. After one repetition this gave place to agoraphobia. For fear of other attacks he stopped reading, and even the sight of a book or an unfamiliar word threw him into mental anguish, palpitations, and perspiration. Still later, on reading a word from a placard he felt suddenly uneasy, had to repeat the word several times, but for all that, forgot it except one syllable; then that seemed to rise up to his brain and he fell down unconscious. Not till the next day did he recall what went before the fit. After a second such attack he attempted suicide, and developed slight delu-

sions; and after a third, became paralysed in the left arm and leg. He had a contracture on the right side of the face, complete anaesthesia on the left, and a hysterogenic point in the lumbar region, and showed transfer phenomena with a magnet. His memory and intelligence suffered, and he was sensitive and irritable. He showed a misshapen skull, sexual impotence, *folie de doute* and arithmomania. Attempts at reading ended in unconsciousness, or he stopped at some word and declared that his tongue forbade him to say it; when at other times he read past it, he saw it advance along the line and his field of view became dark. The loss of consciousness after the "onomatomaniac" seizures, Ballet attributes to an hysterical attack induced by them, and not to the seizures themselves.

Dr. Frigerio reports a case of persistent refusal of food (*Archiv italian. per le malat. nervos. ecc.* 1888, XXV, p. 98), on the part of a syphilitic paranoiac. Though willing to make repeated trials, he saw his food each time magnified to such an extraordinary heap that he was turned back. Anti-syphilitic treatment produced improvement in other respects but not in this, nor was the illusion destroyed by excluding accommodation with atropine. Ophthalmoscopic examination only showed signs of syphilitic retinitis.

In a paper presented before the psychological section of the British Med. Assoc. (in abstract in *Brit. Med. Journal*, September 1, 1888, p. 484), Dr. Oscar T. Woods gave this interesting case of *folie à quatre*. Four members of a family, mother, son, and two daughters, were infected by a third older daughter, and to that degree that a child of the family was murdered by the mother. They were found violent and partly naked, with the delusion "that having killed the fairy, they were freed from their sins and went to heaven." The four recovered in a couple of weeks; the daughter by whom they were infected remained insane.

Nervous children are frequently on the verge of being overpowered by their own imaginations, and offer a ready soil for the growth of hallucinations. Moreau, in an article on the hallucinations of children (*L'Encéphale*, No. 2, 1888), collects ten cases, mostly from recent literature, of children between the ages of two and fifteen thus affected. The exciting causes fall into two classes: moral causes—for example, horrible stories, excessive religious training, life with others subject to such disorders, the terrors of the night, over-vivid impressions of some kinds; and physical causes, like fevers, poison, and disorders of digestion. Hallucinations of sight and hearing are by far the most common, and they are almost always sad and terrifying—devils, monsters, spirits, witches, threatening men, and the like.

Under the title of "*Ein genesener Paralytiker*," Schaefer gives, in his Inaugural Dissertation (Berlin, 1887), some references to the literature of recoveries from general paresis, describing in detail the case of a man who recovered under his care. The recovery is, in all cases, consequent on severe suppuration.

The *Journal of Mental Science* for October 1887 and April and July 1888, contains a long and interesting review, from the standpoint of the alienist, of Dowden's Life of Percy Bysshe Shelley. The poet is shown wavering along in the region between sanity and insanity, sometimes upon one side, sometimes on the other. He was of bad nervous heredity, undersized in brain, unstable, very susceptible to the other sex, had hallucinations and delusions, and yet withal a genius of a type that critics have not scrupled to call angelic.

A stunted brain is not a guarantee against disease of such mind as accompanies it. Dr. Henry M. Hurd (*Am. Jour. of Insanity*, Oct. 1888) shows, with illustrative cases, that insanity is to be found among imbeciles above the lowest grade. The latter are indeed only irritable and impulsive, but those a little higher are perverted, and their impulsive acts are those of insanity and may reach suicide and killing. They do not, however, have delusions and their mental disturbances are transient. In the highest class there are manias and melancholias, simple or with delusions, and their course is not different from that in other insane. Pianetta reported to the congress of Italian physicians at Pavia (*Riv. speriment. di Freniatria*, XIII, 1888) observations on 114 imbeciles in the asylum at Imola. 51 were demented and quiet, 44 demented but occasionally excited and violent, and 19 showed clear mental disease on a foundation of imbecility. Of these 19, ten were maniacal, eight were melancholiacs, and one a paranoiac. The degree of imbecility in these cases was slight, but the road is short to worse conditions.

For the purpose of comparison with similar observations made by others on the disturbances of reading in cases of progressive paralysis, F. Kraemer has studied the loud reading of the uneducated, the aged, and the non-paralytic insane (*Verhandl. d. Physik.-Med. Gesellschaft zu Würzburg*, XXII, 4.) The errors that he found were for the most part insignificant, except for a few of the aged, chiefly those in whom senile dementia had already begun. They, like the paralytics, distorted many words, and added others that had no similarity in sound or sense to those in the text. The non-paralytic insane, even where their alienation was extreme and of long standing, read for the most part with as few errors as the sane.

In his oration on "Education in its relation to Insanity," before the alumni of Haverford College, 1887, Dr. Robert H. Chase furnishes thought for both optimists and pessimists in educational matters. He emphasizes the fact, already known, that on the one hand, improper and unhygienic education is a fruitful source of insanity, and on the other, that the bulk of the insane come from among the uneducated, and that proper education is one of the surest safeguards against its increase.

Cionini (*vide* report of Italian medical congress at Pavia, *Riv. speriment. di Freniatria*, XIII, 1888) measured the thickness of the cortex in 15 cases of paralysis, making 150 measurements on each, 50 in the portion forward of the rolandic region, 50 in that region, and 50 in the portion behind it. He found a general thinning of the whole cortex, most marked in the posterior central convolution, less so in

the anterior, still less in the parts further forward, and least in the rearward parts. It is less marked in the left hemisphere than in the right. Other things being equal, it is thinner in the depths of the sulci, and on the basal and median surfaces, than on the convolutions and convex surface.

A. Borgherini reports, in the *Riv. speriment. di Freniatria*, XIII, 4, the examination of the brain of a dog that had shown clear symptoms of ataxy. The cerebellum was only slightly small, but showed microscopically extended atrophy, irregularly scattered over its cortex, and especially marked in the worm.

Exner and Paneth (*Pflüger's Archiv*, Vol. 40), in the course of certain other experiments, extirpated the gyrus sigmoideus on one side in six dogs. In five of them, disturbances of sight took place which lasted for about four weeks. In six other cases, where the injury was of slightly greater extent, the same "crossed sight disturbances" were occasioned—injury on the right side caused nearly total blindness in the left eye, on the left side in the right eye. Recovery took place in from 7 to 37 days.

A somewhat full discussion of Brown-Sequard's hemilateral lesion of the spinal cord is given by Nolte (*Brown-Sequard'sche Halbseitenläsion des Rückenmarks*, Inaug. Diss., Bonn, 1887). The body of the dissertation is taken up with the description of a man in whom a knife-wound between the second and third dorsal vertebrae caused a hemisection of the cord and a clear exhibition of the corresponding symptoms. The author does not contribute at all to the anatomy of the subject, but the clinical literature is largely given.

Frigerio endorses Ferrier's location of the centre for smell in the *cornu ammonis* (*vide* report of Italian medical congress at Pavia, *Riv. speriment. di Freniatria*, XIII, 1888), on the ground of a case of traumatic paranoia, with hallucinations of smell, in addition to tactual and auditory illusions. The autopsy showed extreme atrophy of that region on the left side.

The ideal way in which to instruct students in the gross anatomy of the central nervous system, is by means of fresh material and elbow advice, both in unlimited quantities; but when students are counted by the hundreds, and the time is very limited, this plan must be modified for the good of the greatest number. No course is better, perhaps, under these conditions, than modelling the parts of the brain on an heroic scale before the class. Prof. John Curtis, of the College of Physicians and Surgeons of New York, has made extensive use of this means, and his models in clay, photographs of which have been made by Dr. Warren P. Lombard, show how admirably some of the difficult points in brain anatomy can be thus elucidated.

W. P. Herringham, M. B., gives in *Brain*, July, 1888, an interesting note on heredity, under the title of "Muscular Atrophy of the Peroneal Type Affecting many Members of a Family." Members of

five generations are listed. The strange feature of the inheritance, and one that the author says is peculiar to the family and not the disease, is the frequency with which perfectly healthy daughters of the line have transmitted their fathers' infirmity to their sons but not their daughters. No daughter of the line is reported as diseased.

The following method of studying cerebral localization in a way different from those of Hitzig and Ferrier, is privately suggested by Dr. Clevenger. He says: "If peripheral points all over the body be stimulated electrically, successively, and the bared brain of the animal, either anæsthetized or recently killed, be covered with paper saturated with the ferro-cyanide of potassium liquid, such as was used in Bain's telegraphic recorder, through which paper the circuit may be completed by a checker-board arrangement of many small metallic plates, it seems probable that the least resistance channels will be indicated by the blue discoloration on the paper at points corresponding very likely with the centres for the stimulated peripheral points. Galvanometric deflections could also be observed. Diffusion would surely be prevented by thus affording many separate points of escape for the current. As to whether it would travel in the course of nerve strands remains to be seen, but with proper precautions I cannot see why it should not do so."